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## ABSTRACT

A multi-purpose bit error rate tester (MPBERT) and a method of bit error rate (BER) testing of electrical and optical components and subsystems of electrical and optical communications systems is provided. The invention provides for bit error rate testing both in the optical and the electrical domain, and for bit error rate testing at higher than achievable rates in the electrical domain by multiplexing and demultiplexing in the optical domain. An MPBERT constructed according to the invention incorporates at least one optical multiplexer, and advantageously incorporates at least one optical demultiplexer, and in some embodiments uses high data rate optical RZ to NRZ conversion and high data rate optical NRZ to RZ conversion.

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